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Examiner: Ian N. Moore

REMARKS

Claims 1 through 18 remain in this application.

Related Applications

Please find below two related applications with a common assignee that we would like to call to the attention of the Examiner:

US Serial No. 09/858,098, entitled, "Optical Shared Protection Ring for Multiple Spans," and filed on May 15, 2001.

US Serial No. 09/903268, entitled, "Method and Apparatus for Signaling in a Shared Protection Ring Architecture," filed on July 11, 2001.

Rejections to the Claims under 35 U.S.C. 102 and 103

The Office Action rejected claims 13, 14, 16 and 17 under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,870,212 to Nathan et al. (the Nathan reference). The Office Action also rejected claims 1 and 2 under 35 U.S.C. 103(a) as being unpatentable over the Nathan reference in view of U.S. Patent No. 6,735,392 to Elahmadi et al. (the Elahmadi reference). The Office Action further rejects claims 3-7 and 15 under 35 U.S.C. 103(a) as being unpatentable over the Nathan reference and the Elahmadi reference in view of U.S. Patent 6,785,438 to Lin (the Lin reference). Thank you for the prior art search and examination of the application and claims. However, after a careful review of the above references and the office action, the Nathan reference, Elahmadi reference and the Lin reference, either alone or in combination, fail to disclose or suggest the requirements of the claims.

Independent Claim 1 and dependent claims 2 through 7

Claim 1 states, "a pair of network elements; two or more working spans coupled between said pair of network elements for carrying communications traffic between said pair of network elements, each working span carrying said communications traffic over a plurality of channels associated with one or more rings; a shared protection span coupled between said network

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elements, said shared protection span providing a plurality of channels; wherein said network elements include circuitry for concurrently switching communication traffic on rings associated with different working spans to respective channels of said shared protection span.” As seen in Figure 4 of the specification and explained in the specification at pages 7-8, paragraphs 27-29, each of the working spans 16ab support a plurality of n wavelengths or n distinct channels, and the shared protect span 18ab includes a plurality of shared protection channels SP1 . . . SP n . As seen in Figure 8, Figure 9 and described in the specification on pages 9 through 11, paragraphs 32 through 38, the shared protect span 18ab can be used to correct simultaneous failures on multiple ring networks. For example, as seen in Figure 8, a failure of λ_{12} on span 16de in a first ring will be switched to the protection spans by network element 12e in the first ring and carried over a first channel SP2 of the shared protection span 18ab. Another failure of λ_{12} on span 16hi in a second ring will be switched by network element 12h to the protection spans in the second ring and carried over a second channel SP1 of the shared protection span 18ab. Thus, communication traffic on rings associated with different working spans are concurrently switched to respective channels of the shared protection span.

The present invention has significant advantages over the prior art, as explained at page 3, paragraph 11. In the prior art, such as WO99/23773 to Elahmadi et al., a shared protection span can only be used to protect against a failure on one ring at a time. Traffic outage will occur if another failure occurs on another ring. The Nathan reference, the Elahmadi reference and the Lin reference cited in the Office Action all have the same disadvantages.

First, with respect to the Nathan reference, it does not disclose the requirement of claim 1, *inter alia*, of “wherein said network elements include circuitry for concurrently switching communication traffic on rings associated with different working spans to respective channels of said shared protection span.” It only describes that spare optical channel 860 in Figures 8, 9 and 10 can be used to protect against a failure on one ring at a time. As seen in Figures 9 and 10, and stated at column 7, lines 12 and 13 (emphasis added), “Spare optical channel 860 can be optically coupled into network 802 *or* network 804 by OCCS 852 and 834.”

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Similarly, the Elahmadi reference teaches away from the present invention as it explicitly states at column 6, lines 28 and 29 that, "Rings 102 and 104 cannot use their protect channels at the same time." So the Elahmadi reference fails to describe the requirement of claim 1, *inter alia*, of "wherein said network elements include circuitry for concurrently switching communication traffic on rings associated with different working spans to respective channels of said shared protection span."

Finally, the Lin reference nowhere describes a shared protect channel so it certainly does not describe the requirement of claim 1, *inter alia*, of "wherein said network elements include circuitry for concurrently switching communication traffic on rings associated with different working spans to respective channels of said shared protection span."

Furthermore, the combination of the Nathan reference, Elahmadi reference and the Lin reference fails to suggest the requirement of claim 1, *inter alia*, of "wherein said network elements include circuitry for concurrently switching communication traffic on rings associated with different working spans to respective channels of said shared protection span." Even if, as the Office Action asserts in Page 6, third paragraph, that the shared protection span/channel in the Nathan reference can be modified to include a plurality of input signals in view of the Elahmadi reference, such teachings would not meet the requirements of the claims. Neither reference teaches that the communication traffic on rings associated with different working spans can be concurrently switched to respective channels of the shared protection span. In fact the Elahmadi reference explicitly teaches away from the requirement when it states at column 6, lines 28 and 29 that, "Rings 102 and 104 cannot use their protect channels at the same time." Thus, the combination of the references fails to suggest the requirements of the claims.

Independent Claim 8 and dependent claims 9 through 12

Independent claim 8 states, "passing communications traffic between a pair of network elements, where the pair of network elements are coupled by two or more working spans each carrying communications traffic between the pair of network elements over a plurality of

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channels associated with one or more rings and by a shared protection span supporting a plurality of channels over which communication traffic may be passed; in the event of failures in channels associated with two or more rings associated with different working spans, concurrently transferring communication traffic associated with each of said two or more rings over said shared protection span."

The Nathan reference, the Elahmadi reference and the Lin reference, either alone or in combination, fail to disclose or suggest the requirements of the claims. With respect to the Nathan reference, it does not disclose the requirement of claim 8, *inter alia*, of "in the event of failures in channels associated with two or more rings associated with different working spans, concurrently transferring communication traffic associated with each of said two or more rings over said shared protection span." It only describes that spare optical channel 860 in Figures 8, 9 and 10 can only be used to protect against a failure on one ring at a time. As seen in Figures 9 and 10, and stated at column 7, lines 12 and 13 (emphasis added), "Spare optical channel 860 can be optically coupled into network 802 *or* network 804 by OCCS 852 and 834." Similarly, the Elahmadi reference teaches away from the present invention as it explicitly states at column 6, lines 28 and 29 that, "Rings 102 and 104 cannot use their protect channels at the same time." Finally, the Lin reference nowhere describes a shared protect channel so it certainly does not describe the requirements of claim 8.

Furthermore, the combination of the Nathan reference, Elahmadi reference and the Lin reference fails to suggest the requirement of claim 8, *inter alia*, of "in the event of failures in channels associated with two or more rings associated with different working spans, concurrently transferring communication traffic associated with each of said two or more rings over said shared protection span." The Office Action asserts in Page 12, third paragraph, with respect to Claim 8 that the Elahmadi reference, teaches concurrently transferring communication traffic associated with each of said two or more rings over said protection path. However, it cites Figure 6 which does not even include a shared protection path. When the Elahmadi reference does illustrates a shared protect fiber 105 in Figure 7, the Elahmadi reference explicitly teaches

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away from the requirement stating at column 6, at lines 28 and 29, that, "Rings 102 and 104 cannot use their protect channels at the same time." Thus, the combination of the references fails to suggest the requirements of the claims.

The Office Action mentions U.S. Patent No. 6,038,044 to Fee et al. (the Fee reference) at page 12, paragraph 3 also with respect to claim 8, but the Fee reference does not disclose a shared protection path or concurrently transferring communication traffic associated with each of said two or more rings over said shared protection span. The Office Action states that the Fee reference teaches "detecting failures in two or more rings and transferring the traffic to an end to end spared path," however it provides no citation. The only figure with multiple failures in the Fee reference is Figure 6, but those two failures are in the same ring as stated at column 6, lines 52 through 57. Furthermore the Fee reference nowhere discloses a shared protection path or concurrently transferring communication traffic associated with each of said two or more rings over a shared protection span. Thus, the Fee reference can add nothing to the teachings of the Nathan reference or the Elahmadi reference to suggest the requirements of the claims.

Independent Claim 13 and dependent claims 14 through 18

Independent claim 13 states, "interface circuitry for coupling to two or more incoming working spans and two or more respective incoming protection spans, each of said working spans operable to carry communications traffic over a plurality of channels associated with one or more rings; and switching circuitry for concurrently coupling channels from different incoming protection spans to a shared protection span."

The Nathan reference, Elahmadi reference and the Lin reference, either alone or in combination, fail to disclose or suggest the requirements of the claims. With respect to the Nathan reference, it does not disclose the requirement of claim 13, *inter alia*, of "switching circuitry for concurrently coupling channels from different incoming protection spans to a shared protection span." It only describes that spare optical channel 860 in Figures 8, 9 and 10 can only be used to protect against a failure on one ring at a time. As seen in Figures 9 and 10, and stated

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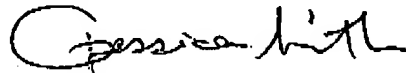
at column 7, lines 12 and 13 (emphasis added), "Spare optical channel 860 can be optically coupled into network 802 *or* network 804 by OCCS 852 and 834." Similarly, the Elahmadi reference teaches away from the present invention as it explicitly states at column 6, lines 28 and 29 that, "Rings 102 and 104 cannot use their protect channels at the same time." Finally, the Lin reference nowhere describes a shared protect channel so it certainly does not describe the requirements of claim 13.

CONCLUSION

For the above reasons, the foregoing amendment places the Application in condition for allowance. Therefore, it is respectfully requested that the rejection of the claims be withdrawn and full allowance granted. Should the Examiner have any further comments or suggestions, please contact Jessica Smith at (972) 477-9109.

Respectfully submitted,

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Dated: January 18, 2005

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